

**BISON CONTROL AREA PROGRAM  
ANNUAL REPORT OF SURVEY ACTIVITIES  
NOVEMBER 2006 – APRIL 2007**

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### ABSTRACT

Bovine tuberculosis (*Mycobacterium bovis*) and brucellosis (*Brucella abortus*) are endemic in bison (*Bison bison*) herds in and around Wood Buffalo National Park, and the adjacent Slave River Lowlands. In 1987, the Bison Control Area (BCA), along with a surveillance program, was created to minimise the risk of disease transmission to the disease-free Mackenzie and Nahanni-Liard herds in the Northwest Territories. During the 2006-2007 surveillance season, we used a Cessna 337, to fly 12 shoreline patrols along the northern boundary of the BCA on a weekly basis from December 20, 2006 to April 12, 2007.

Total survey time during shoreline patrols was 26.5 hours. We used a Cessna 210 to fly one semi-comprehensive aerial survey of BCA zone I and partial Zone II, from 13-16 February 2007; total survey time was 18.5 hours. From 19-24 March 2007, we used a Cessna 210 to fly the annual comprehensive survey of BCA zones I and II; total survey time was 35.9 hours. In total, we flew 92.8 hours, including ferry time, to systematically survey the BCA during the 2006-2007 surveillance season and did not observe any bison (or their sign, i.e., fresh tracks and/or feeding craters) within the BCA during our surveillance flights.

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## INTRODUCTION

Free-ranging wood bison (*Bison bison athabasca*) in and around Wood Buffalo National Park (WBNP) and the Slave River Lowlands (SRL) are infected with bovine tuberculosis and brucellosis (Tessaro *et al.* 1990, Joly and Messier 2001) (Figure 1). These northern bison herds contracted the two cattle diseases when 6,673 diseased plains bison were moved from the National Buffalo Park at Wainright, Alberta to WBNP between 1925 and 1928 (Fuller 2002). Risk of infection to healthy free-ranging bison as well as commercial cattle and bison herds has been a chronic management problem ever since (see Connelly *et al.* 1990, APFHRAN 1999, RAC 2001).

Results from Jolly and Messier (2004) showed that bison within WBNP have overall apparent prevalence rates of 49% and 31% for tuberculosis and brucellosis respectively. These results suggest that the diseases will continue to persist in the affected bison in and around WBNP and further supports the need to mitigate the risk of infection to the health status of the Mackenzie Wood Bison herd (Tessaro *et al.* 1993, Nishi 2002), the presumed disease free status of the Hay-Zama herd located in northwest Alberta, and the Nahanni-Liard herd located near the Mackenzie Mountains (Gates *et al.* 1992a) (Figure 1).

The diseased bison in and around WBNP also present the most important limiting factor to the reestablishment of other healthy free-roaming herds in the region that could contribute to the resource-based economies of surrounding communities (Gates *et al.* 2001b).

In March 1996, because of ongoing concerns of the commercial bison industry, the Canadian Bison Association requested the Animal, Plant and Food Health Risk Assessment Network (APFRAN), and the Canadian Food Inspection Agency to conduct a formal risk assessment. The objective was to determine the risk of infection with tuberculosis and/or brucellosis from bison in WBNP and surrounding area during a 12 month period, for each of three "at risk" groups: commercial cattle, commercial captive bison and disease-free, free-ranging bison. In January 1999, APFRAN completed the risk assessment and concluded that disease-free, free-ranging bison had the highest probability of becoming infected with bovine brucellosis and/or tuberculosis (APFRAN 1999).

As the APFRAN (1999) disease risk assessment was not based on terrain and habitat variability, a follow-up research project was initiated to compile local knowledge on bison movement and distribution around WBNP, define the relative influences of biophysical and management factors, and to integrate quantitative and local qualitative data on biophysical factors into a bison movement model (Gates *et al.* 2001a, Mitchell 2002). The research focused on bison movements and distribution in the region in order to provide a model and maps for informing the development of disease risk management measures and to update the APFRAN risk model. The results suggested that the highest likelihood for bison dispersal occurred in corridors that were parallel to the Peace River in the area of Fort Vermillion, and with the broadest network of corridors between High Level and WBNP.

Additional results from Gates and Wierzchowski's (2003) movement corridor analysis indicate that potential movements of bison between WBNP and the Mackenzie

Bison Range are most likely to occur in the northern section of surveillance Zone I in the Bison Control Area (BCA). Gates and Wierzchowski (2003) recommended that in addition to the in-situ surveillance of BCA Zone I, aerial surveillance of the area between Buffalo Lake and Highway #5 should be conducted to ensure that the disease-free Mackenzie herd do not come into contact with infected bison that may occupy this area. Due to the propensity of bison to use meadows near lakes and rivers, they also suggested that aerial reconnaissance of the area on the northwest side of Buffalo Lake might be worthwhile.

Continuation of shoreline and surveillance surveys is critically important for early detection of bison in the control area, due to the ongoing risk of disease transmission from WBNP bison to the Mackenzie and Nahanni bison herds.

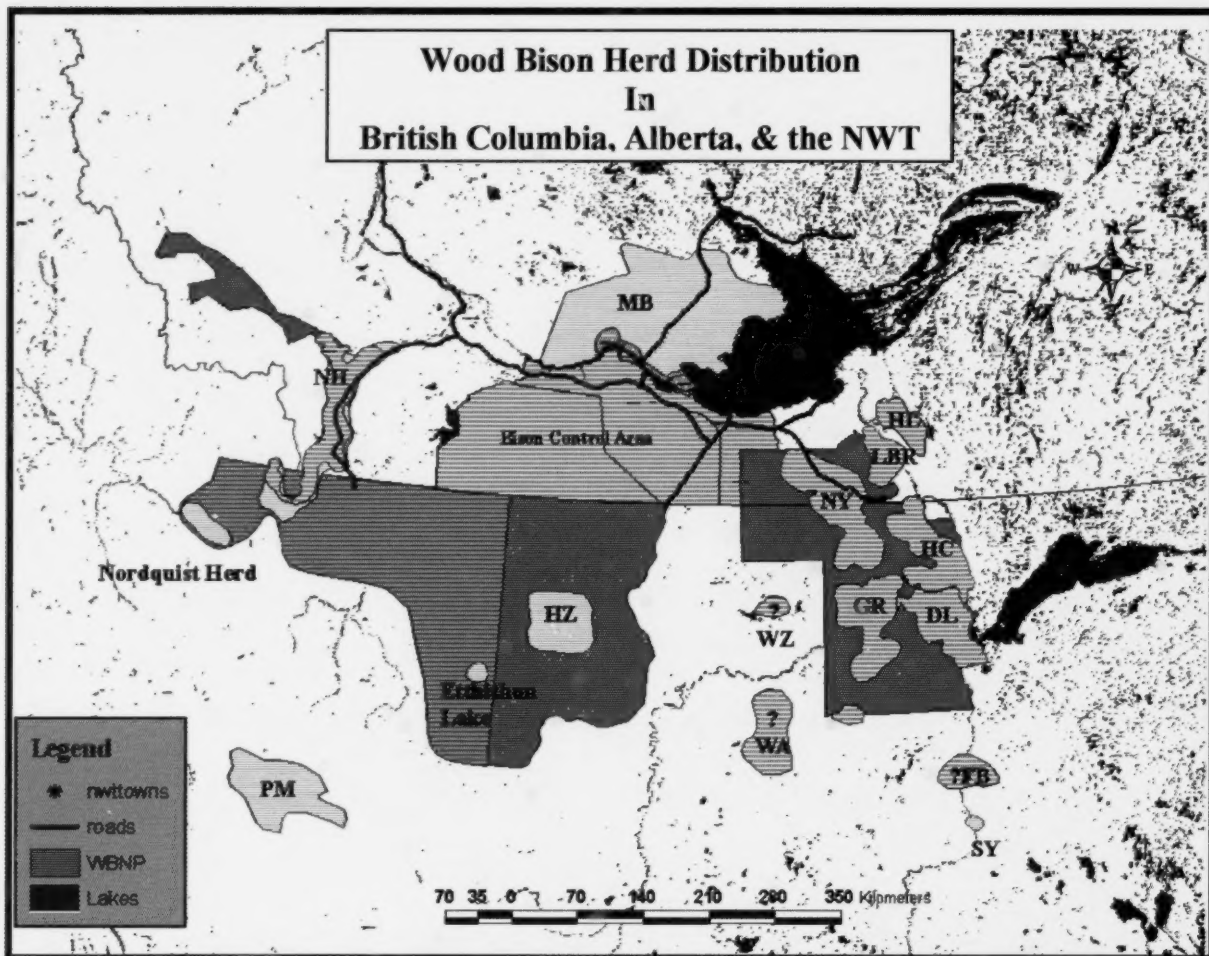


Figure 1 Distribution of bison herds in Northern Canada. For the most recent information, visit [www.enr.gov.nt.ca](http://www.enr.gov.nt.ca).

Note: Bison herds considered to be infected with bovine tuberculosis and brucellosis are shown in light green; HL = Hook Lake, LBR = Little Buffalo River, NY = Nyarling, HC=Hay Camp, GR=Garden River, DL=Peace-Athabasca Delta, FB=Fire Bag, WZ=Wentzel, WA=Wabasca, BM=Birch Mountain. Bison herds considered to be disease-free are shown in light beige grey; MB = Mackenzie, NH = Nahanni, PM= Pink Mountain, HZ = Hay Zama, SY = Syncrude/Fort McKay. The delineation of home ranges originated from various research (Reynolds & Hawley 1987, Joly & Messier 2001, Harper et.al 2000, Wood Buffalo National Park, Resources, Wildlife and Economic Development, British Columbia Ministry of Environment, and Alberta Environment.)

### **The Bison Control Area Program**

In 1987, the Government of the Northwest Territories (GNWT) implemented a program to reduce the risk of contact between infected and disease-free bison (Gates and Gray 1992; Gates *et al* 1992b). The program entailed defining an area, the Bison Control Area (BCA), from which bison are excluded through surveillance and active management. The BCA originally included lands south of the Mackenzie River and North of the Mackenzie Highway between Mills Lake (near Fort Providence) and Hay River. In 1990, the BCA was expanded to encompass the area between the Alberta-NWT border and southern shoreline of the Mackenzie River; the western boundary was delineated by Trout River; the eastern boundary was outlined by the Buffalo River and western boundary of WBNP (Figure 2). Presently, the BCA encompasses 3, 936km<sup>2</sup>.

Since 1993, the Government of the Northwest Territories (Department of Environment and Natural Resources) and the Government of Canada (Parks Canada) have jointly funded the Bison Control Area Program (BCAP). Cost of surveying the BCA is jointly funded under a Memorandum of Understanding between the two agencies. This report summarizes the results of the Bison Control Area Program for the 2006/2007 surveillance season (i.e. December 2006 - April 2007).





Figure 2 The Northwest Territories Bison Control Area showing the three surveillance zones.

### Goals and Objectives

The goal of the Bison Control Area Program in the Northwest Territories is to reduce the risk of infection of the Mackenzie and Nahanni herds with tuberculosis and brucellosis. Our overall approach to achieve this goal is to conduct systematic aerial surveys with an extensive public communication program.

The objectives of the Bison Control Area Program are to:

- Detect and remove any bison in the BCA, and to prevent establishment of bison herds or individuals in this area<sup>1</sup>;
- Continue surveillance of the bison control area; and
- Increase public awareness of the Bison Control Program.



Slide 1 View of the Mackenzie River looking north west towards Fort Providence and representing the area covered during the shoreline patrols.

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<sup>1</sup> Wood bison (*Bison bison athabasca*) are a threatened subspecies of North American Bison and listed as such on the federal *Species at Risk Act* (SARA). They are also listed on Appendix II by the Convention on the International Trade In Endangered species (CITES). Because of the disease risk, any bison found in the BCA are considered nuisance wildlife under section 61 of the NWT Wildlife Regulations Act (Government of the Northwest Territories 1992). This regulation states that NWT residents may shoot any bison sighted in the BCA.



## METHOD

To ensure consistency and comparability of search effort and resulting wildlife observations, the same survey methodology was used as previous years (Gates and Gray 1992, Gates *et al.* 1992, Williamson *et al.* 1995, Antoniak and Gates 1996, Bohnet and Gates 1997, Boulanger *et al.* 1998 & 2001, Tanguay, *et al.* in prep, Potvin *et al.* in prep, Jewell *et al.* in prep, Campbell *et al.* 2003.).

The BCA is stratified into three discrete zones (Figure 2). Active surveillance through aerial observation is conducted during winter months when bison and bison sign are most discernible (i.e., tracks and/or feeding craters) and visibility is optimal. Survey effort and frequency of monitoring is allocated according to the presumed likelihood of bison moving into the area (see AFRAN 1999). Consequently, this survey design requires frequent (weekly) surveys of the shoreline areas that are closest to the range of Mackenzie Bison Herd and the range of bison in WBNP. Less frequent surveys (semi-comprehensive and annual comprehensive) are used to survey larger areas (BCA Zones I and II) in the BCA.

We flew three different types of aerial surveys to systematically survey the BCA throughout the surveillance season. The first type of survey was a weekly shoreline patrol of the high-risk area (Zone I). We continued to fly a slightly revised standard shoreline patrol route as recommended by Tanguay *et al.* after the 1999-2000 season (Tanguay *et al.* in prep) (Figure 3). This route was extended to include the Slave Point area, as in the previous season, there had been several reports of bison tracks leading from that area to Point De Roche in the BCA and this information warranted the monitoring of that area.

This survey was conducted at approximately seven-day intervals and had a planned flight time of about two and one half hours per patrol flight.

### Shoreline Patrol Route

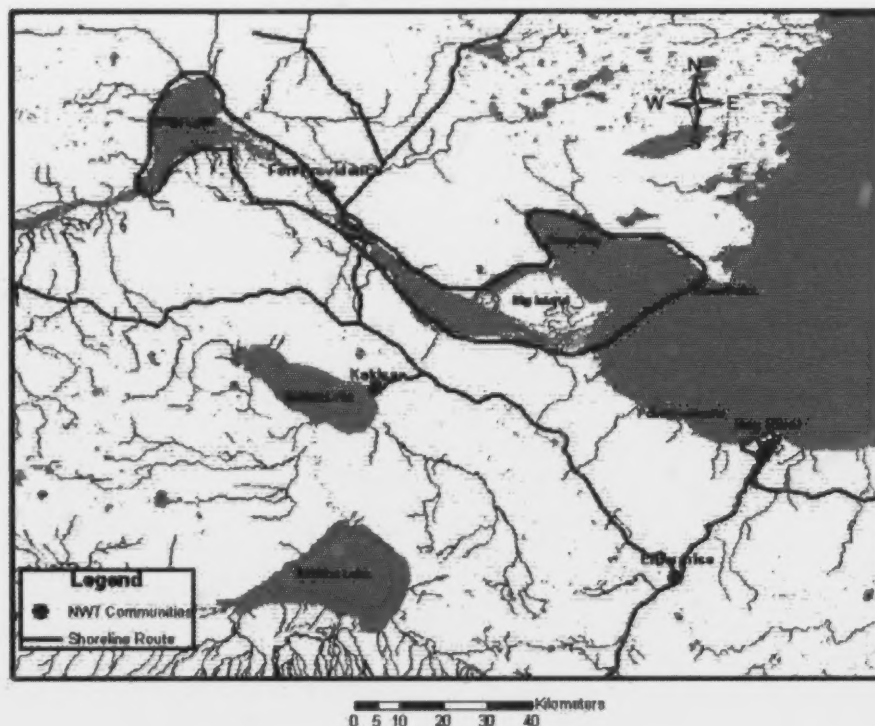


Figure 3 Standardized shoreline patrol route for the Bison Control Area flown in 2006 – 2007 season.

The second type of survey was a one-time semi-comprehensive surveillance flight of Zone I; this survey was performed in February 2007. This survey covers a larger area and requires about 15 hours to complete. The final survey type was the annual comprehensive surveillance flight of Zones I and II. For this annual comprehensive survey performed in late March, we allocated approximately 35 hours of flight time. We did not conduct aerial surveys in Zone III of the BCA.

Shoreline patrols were flown in a Cessna 337. Both the semi-comprehensive survey and the annual comprehensive survey flights were performed using a Cessna 210. A local community observer and pilot from Landa Aviation in Hay River conducted all shoreline patrols. There was no requirement to conduct verification flights. The survey crew for the surveillance flights of Zone I and the annual comprehensive survey of Zones I and II consisted of a pilot, the BCA Technician and two community observers. The technician sat in the front seat while the observers occupied the left and right rear seats of the aircraft. Survey aircraft were flown at approximately 250 to 300 metres above ground level at an air speed of approximately 190 km/hr.

We adapted flight paths from previous surveys to plan our routing for aerial surveys in the 2006 – 2007 surveillance season. However, routes used in previous years, for both the semi-comprehensive and comprehensive surveys were updated and restructured this season in order to put an emphasis on areas of probable importance, as identified by local observers and past BCA reports. We continued to extend survey lines into the northwest corner of WBNP, in addition to concentrating more coverage in higher risk areas (see Figure 5.1 and 6.1).

Utilising predetermined flight routes ensures maximum coverage for both surveillance surveys, and allows the BCA Technician to pre-plan fuel stops and breaks, which increases survey efficacy and improves safety. Pre-planned routes were used as a guide, and followed for the bulk of the survey only deviating from them to investigate animal tracks or other abnormal activities such as wolf kills; in this way we could be sure of consistency and some accuracy in the area covered. This allowed us to survey Zones I and II with the greatest possible coverage given available flying hours.

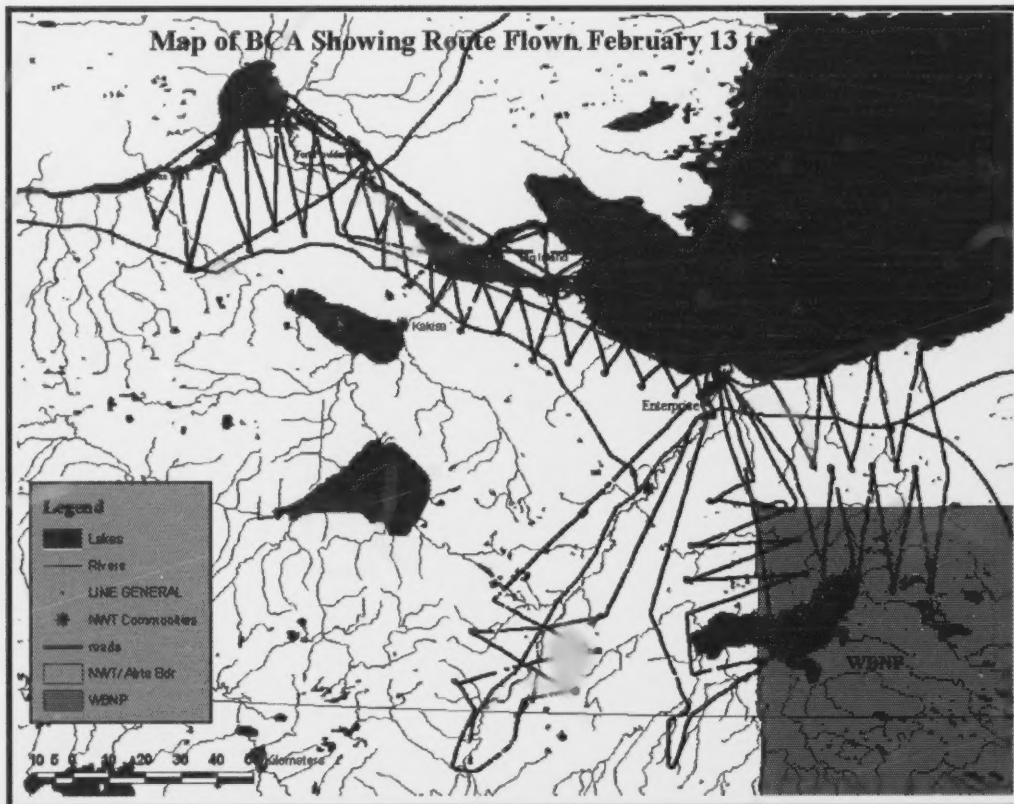


Figure 4 Actual routes flown for the semi-comprehensive survey February 13<sup>th</sup> to 16<sup>th</sup>, 2007, from Hay River & Fort Providence, NWT.

To improve sampling quality and precision during surveillance surveys, we employed a known strip (transect) width of 500 metres and positioned electrical tape on the windows of the aircraft to define the boundaries of the strip within which the observers count animals. With the aid of observers, the BCA technician affixed the markers prior to flights using a known calculation [ $w = (W/H) \cdot h$ ]. Once this exercise was complete, a test flight was carried out to ensure marker placement accuracy; the test flight entailed positioning the aircraft alongside a known 500-metre length on the ground, at survey altitude, and confirming whether the fixed tape positions aligned with the known

ground length. Implementing a known strip (transect) width enables us to accurately calculate percent cover.

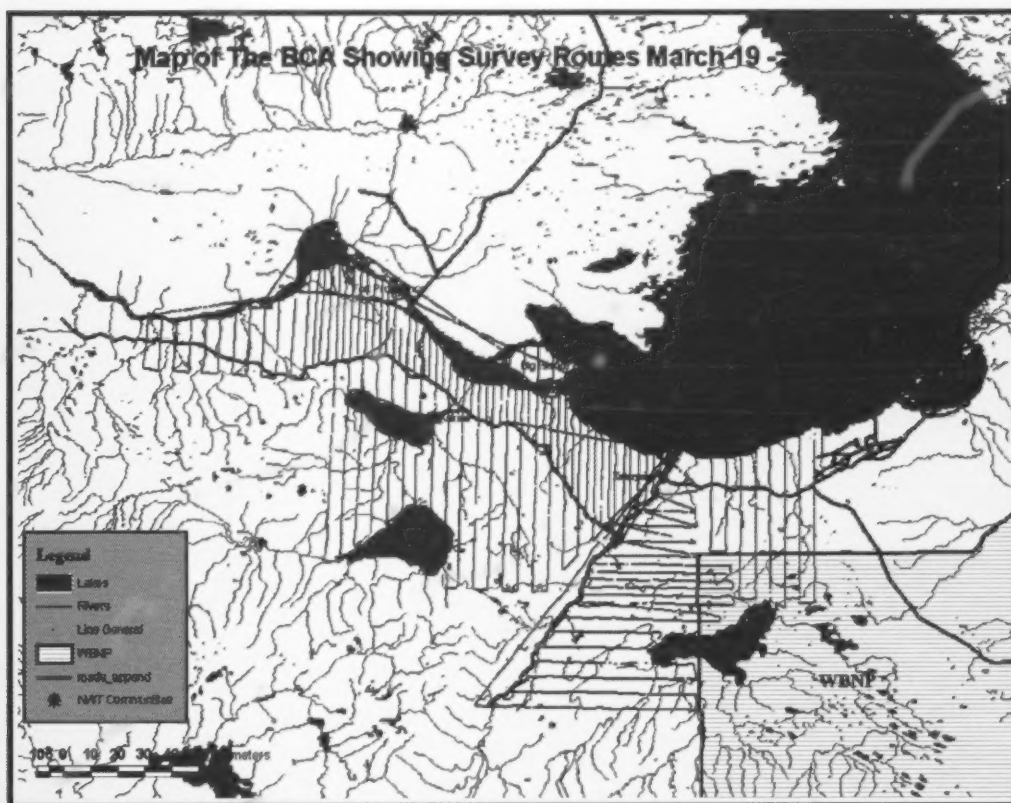


Figure 5 Routes Flown for the March comprehensive survey completed March 19th to 24<sup>th</sup>, 2007.

Wildlife observations during weekly shoreline patrols were most often recorded on a NTS 1:250,000-reproduction map of the survey area. This was entered into an Excel spreadsheet and then transferred into a Database IV file format for export into Arc Map 9.1 Geographic Information System (Environmental Systems Research Institute, 1999-2004). An Ozi Explorer Mapping program (Des Newman, version: 3.95.4) was used to plot the route grid for the survey routes, this was uploaded into a hand-held Garmin GPS



map 76S, and was used by the pilot for navigation and to maintain adherence to the planned routes. The survey routes plotted in Ozi Explorer were verified and checked and entered into ASPEN Global Positioning System Field Software (Trimble Survey and Mapping Products, 1998). All observations of large mammals (*i.e.*, moose, caribou, and wolves) were recorded using ASPEN Global Positioning System Field Software, during the semi-comprehensive and annual comprehensive flights. These data were prepared for export to Arc Map 9.1, with Pathfinder Office Software (Trimble Survey and Mapping Products, 1998).



Slide 2    Photo of typical BCA topography near Buffalo Lake looking towards the Cameron Hills.

## RESULTS

Our aerial surveys were conducted during optimum snow and light conditions, whenever possible. However, some flights were conducted in less suitable conditions in order to maintain adequate and regular surveillance (Appendix A).

### Shoreline Patrols

Weekly shoreline patrols were initiated on December 20, 2006 and continued until April 12, 2007 (Figures 6.1 - 6.12 Maps). The BCA technician accompanied the observer to provide and establish the required data collection protocol and assess the actual location of the patrol route. The route was extended to include the Slave Point area, due to previous reports of possible bison tracks into the BCA from that area. By monitoring the area on a weekly basis it was believed that the program would have a good indication of bison activity, should future reports of tracks into the BCA from Slave Point be received. With the exception of patrol number one, bison were seen in the Slave Point area.

Total flight time for the 12-shoreline patrols flown was 38.4 hours<sup>2</sup> (Table.1) with a mean duration of 3.2 ( $\pm$  0.25 Standard Deviation) hours. A Cessna 337 was used to complete all shoreline patrols. On April 12, 2007 the last scheduled shoreline patrol flight was flown. This flight was again made with the BCA technician to assess snow conditions and the potential risk of bison movement into the BCA. It was determined that ice conditions in these areas would likely continue to degrade very quickly and deter bison from crossing the Mackenzie River. Also, although snow conditions still allowed for the identification of tracks during this patrol, the forecasted warm weather (10° C to

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<sup>2</sup> Total flight time for shoreline patrols includes ferry time.

12° C in the Fort Providence area) for the following four days would rapidly eliminate any chances of further track identification. In respect of these observed conditions, we made the decision to discontinue shoreline patrol surveys for the 2006/2007 season, before the next planned shoreline patrol on April 18, 2007.

Table 1 Summary of shoreline patrols in the Bison Control Area from December 2006 to April 2007<sup>3</sup>.

Date	Ferry Hrs	Survey Hrs	Date	Ferry Hrs	Survey Hrs
20-Dec-2007	1.0	2.5	03-Feb-2007	1.0	2.2
31-Dec-2007	1.0	2.2	08-Mar-2007	1.0	1.9
05-Jan-2007	1.0	2.1	14-Mar-2007	1.0	1.8
11-Jan-2007	1.1	2.0	28-Mar-2007	1.0	2.0
18-Jan-2007	0.9	2.9	05-Apr-2007	1.0	2.0
24-Jan-2007	1.0	2.7	12-April-2007	1.0	2.2
Total ferry hours		12.0	Total survey hours:		26.5



### Shoreline Patrol Number One

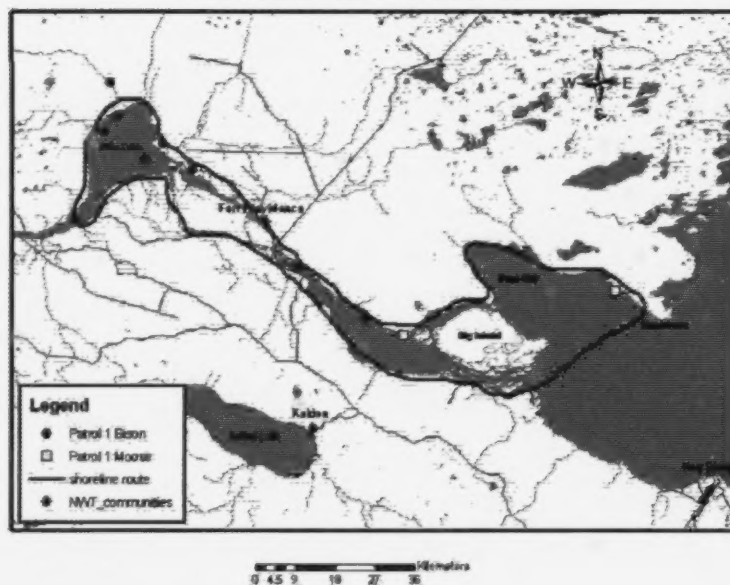


Figure 6.1 Map of patrol number one, completed December 20, 2006, with a duration of 2.5 hours transect time.

### Shoreline Patrol Number Two

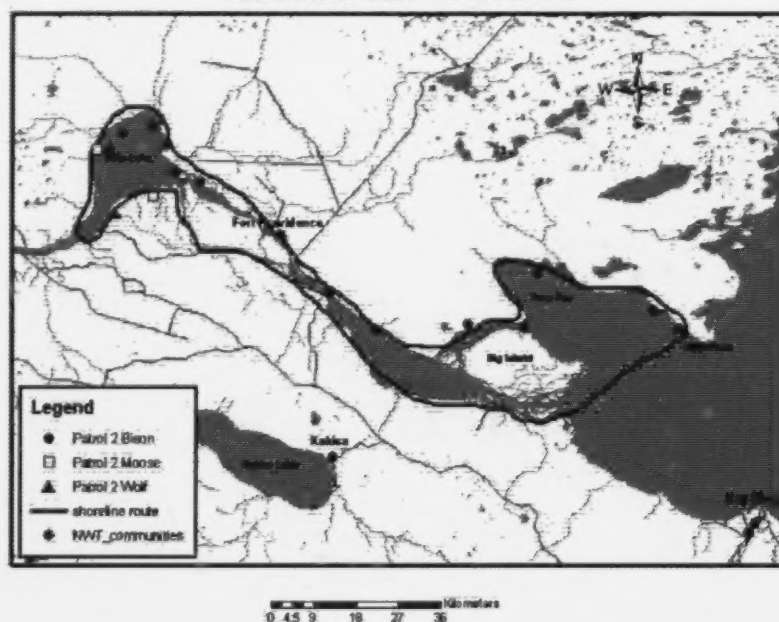


Figure 6.2 Map of patrol number two, completed December 31<sup>st</sup> 2006, with a duration of 2.2 hours transect time.

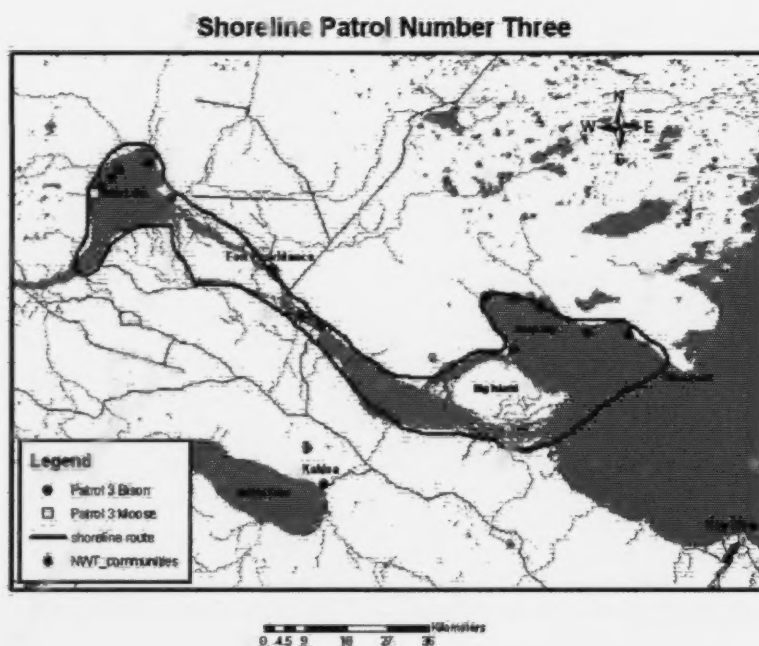


Figure 6.3 Map of patrol number three completed January 5<sup>th</sup> 2007, with a duration of 2.1 hours transect time.

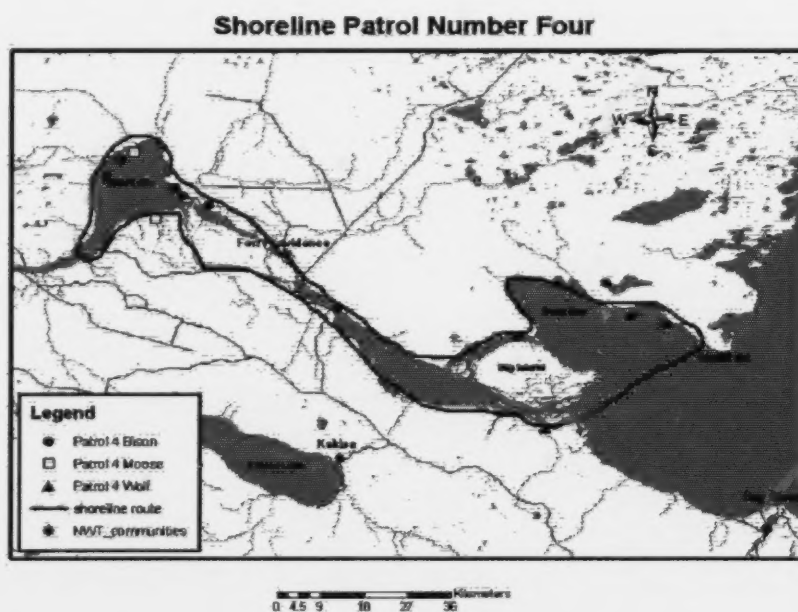


Figure 6.4 Map of patrol number four completed January 11<sup>th</sup> 2007, with a duration of 2.0 hours transect time.

## Shoreline Patrol Number Five

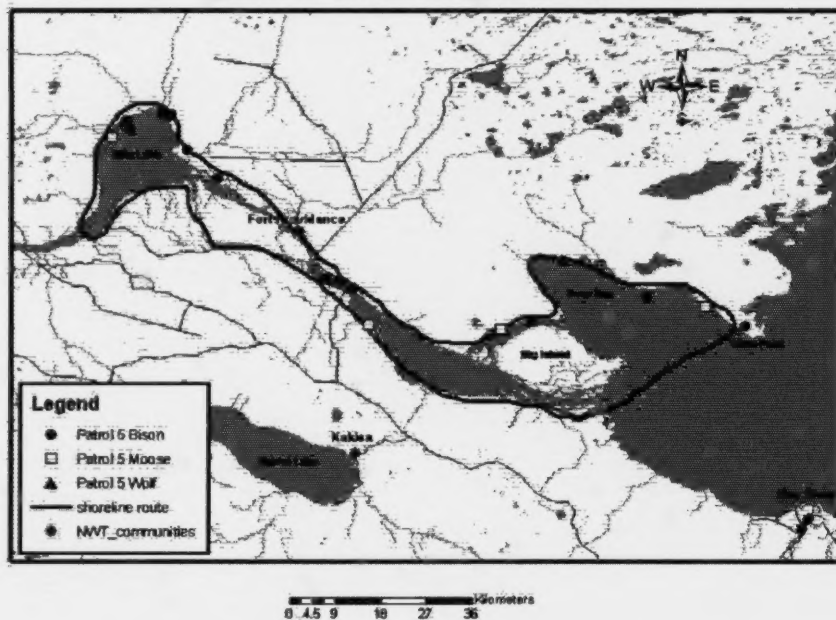


Figure 6.5 Map of patrol number five, completed January 18<sup>th</sup> 2007, with a duration of 2.9 hours transect time.

## Shoreline Patrol Number Six

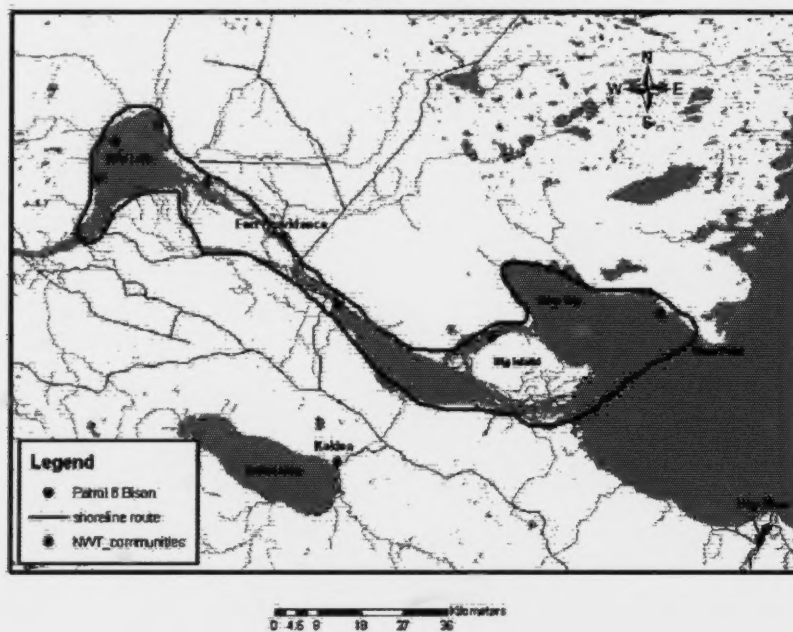


Figure 6.6 Map of patrol number six, completed January 24<sup>th</sup>, 2007, with a duration of 2.7 hours transect time.

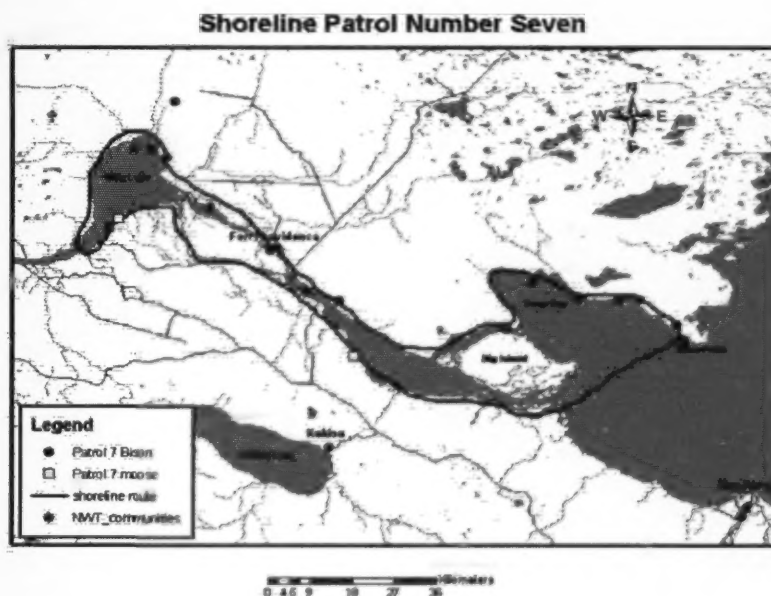


Figure 6.7 Map of patrol number seven, completed February 3<sup>rd</sup> 2007, with a duration of 2.2 hours transect time.

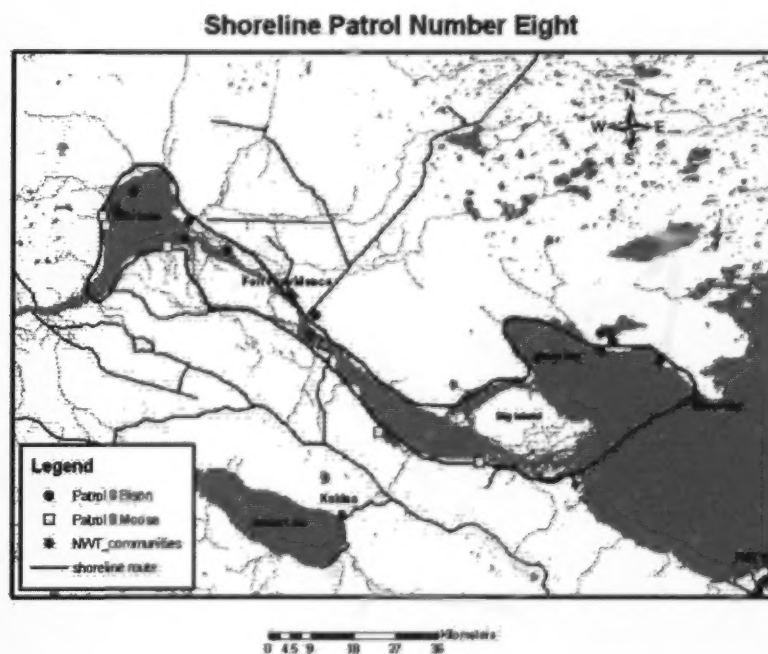


Figure 6.8 Map of patrol number eight, completed March 8<sup>th</sup> 2007, with a duration of 1.9 hours transect time.

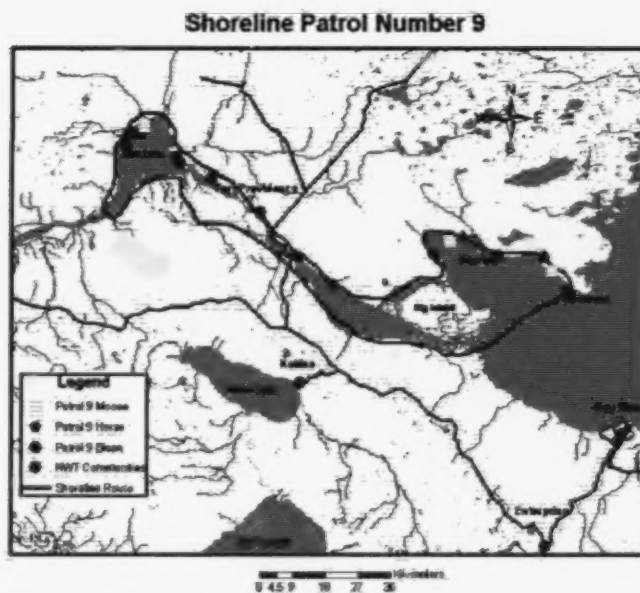


Figure 6.9 Map of patrol number 9, completed March 14<sup>th</sup> 2007 with a duration of 1.8 hours transect time.

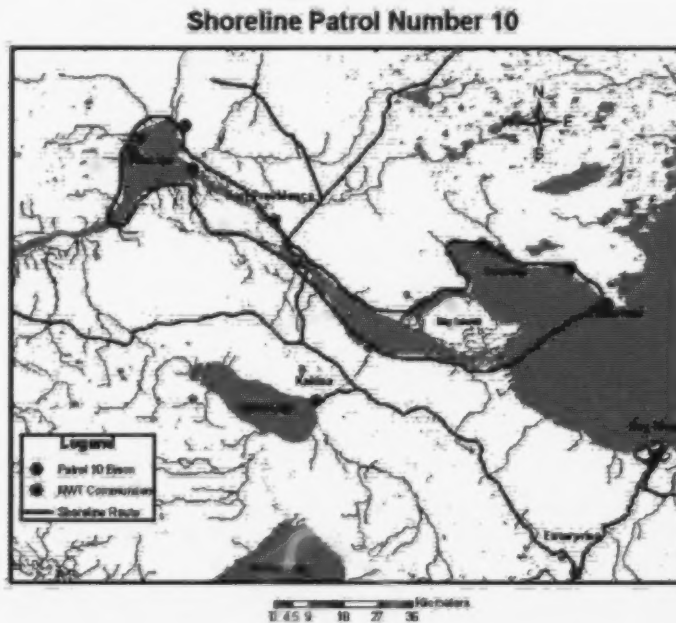
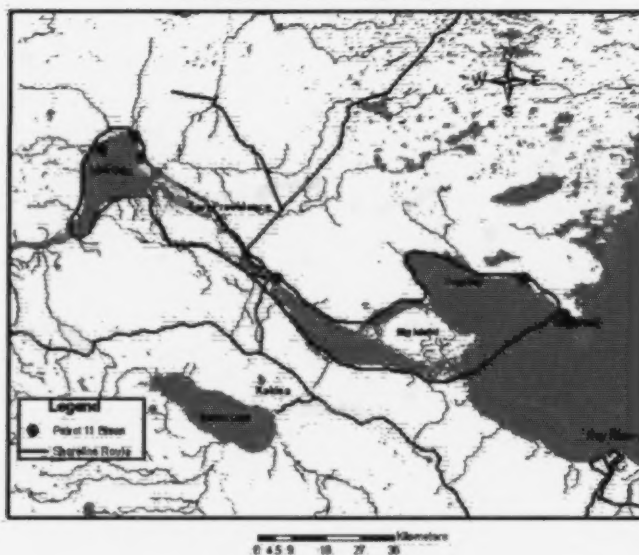
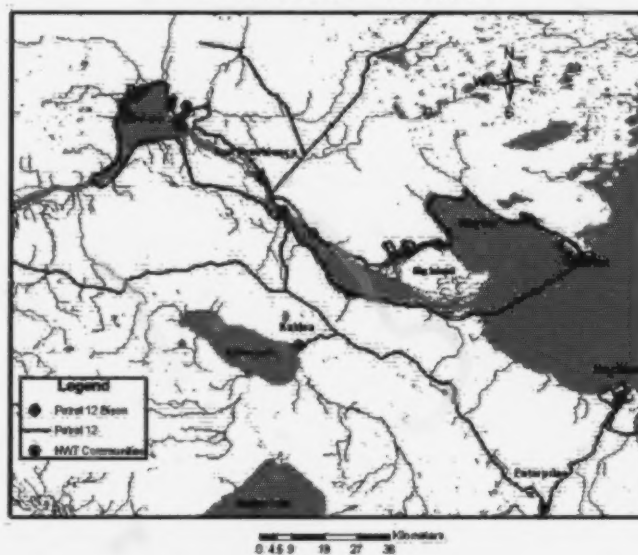


Figure 6.10 Map of patrol number 10 completed March 28<sup>th</sup> 2007 with a duration of 2.0 hours transect time.



**Shoreline Patrol Number 11**

**Figure 6.11** Map of patrol number 11, completed April 5<sup>th</sup> 2007, with a duration of 2.0 hours transect time.

**Shoreline Patrol Number 12**

**Figure 6.12** Map of patrol number 12, completed April 12<sup>th</sup>, 2007 with a duration of 2.2 hours transect time.

### Surveillance Surveys

We conducted one semi-comprehensive surveillance flight of BCA Zone I and partial Zone II this season. This survey was conducted from February 13<sup>th</sup> – 16<sup>th</sup>, 2007 (see Figures 4, 7.1, 7.2, 7.3 and 7.4). The total time flown on the semi-comprehensive survey was 18.5 hours. The comprehensive surveillance flight of BCA Zones I and II was conducted from March 19<sup>th</sup> – 24<sup>th</sup>, 2007 (Figures 5, 8.1, 8.2, 8.3 and 8.4), and required 35.9 hours to complete (Table 2). For both surveys a Cessna 210 was used.

The longer duration of flight time used during the semi-comprehensive survey as compared to last year was largely due to the investigation of questionable tracks in the Mills Lake area; two transects were extended a short way south into Alberta to investigate the potential for bison movement from either the Hay Zama herd or the WBNP Bison herd (Figure 4).

Table 2 Summary of surveillance flights in the Bison Control Area from February to March 2007. A Cessna-210 aircraft was used to complete both surveillance surveys.

<b>Date</b>	<b>BCA Zone</b>	<b>Hours Flown</b>
13 - 16 Feb.2007	I (Semi)	18.5
19 - 24 Mar.2005	I & II (Comp)	35.9
		<b>Total Hours: 54.4</b>

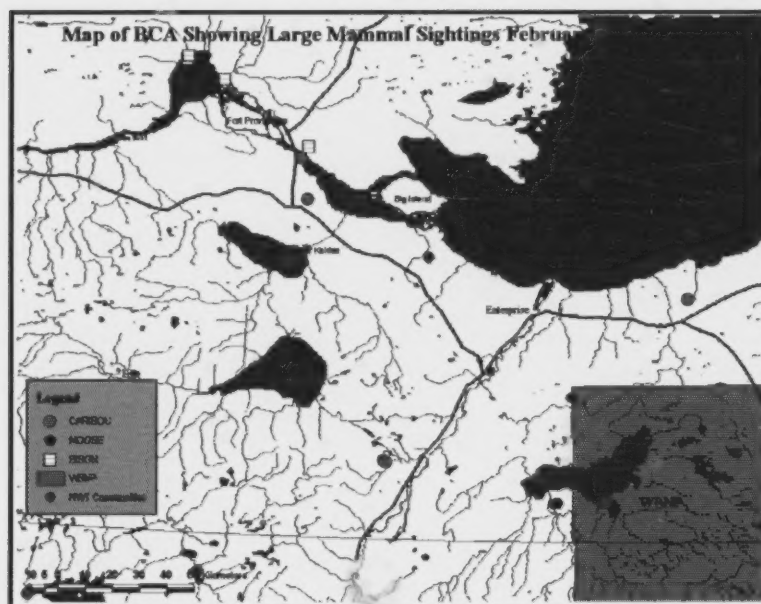


Figure 7.1 Large animal sightings made during the semi-comprehensive survey flown February 13 to 16, 2007 in the BCA, Zones 1 and 2.

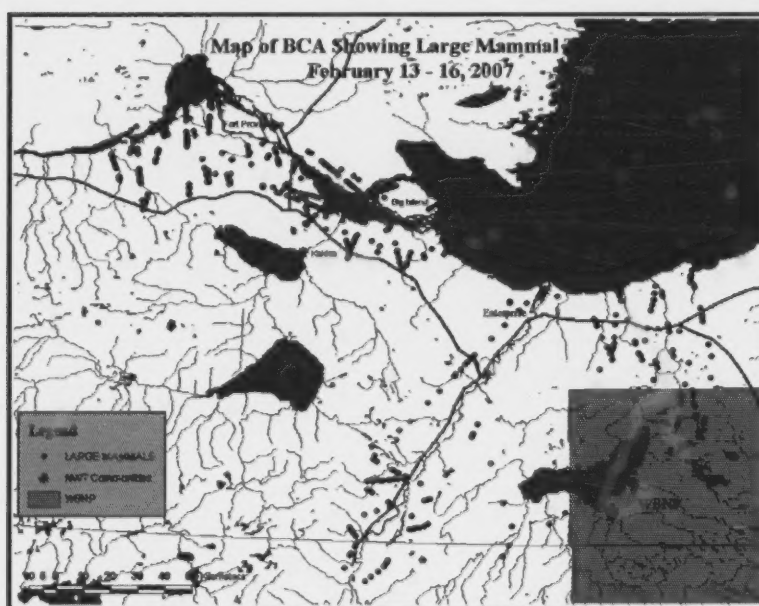


Figure 7.2 Map showing large mammal tracks located during the February semi-comprehensive survey of the BCA, February 13 – 16, 2007.



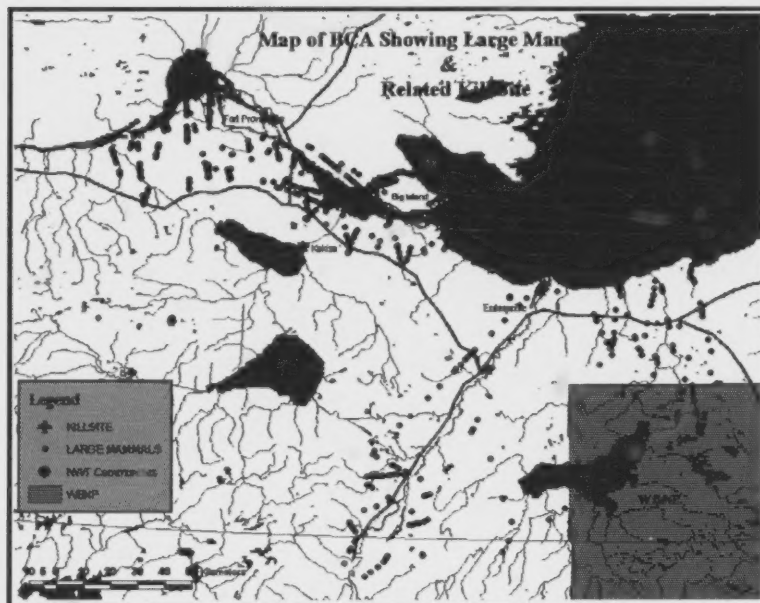


Figure 7.3 Large mammal track sightings shown in relation to wolf kills found during the February semi-comprehensive of the BCA during February 13 – 16, 2007.

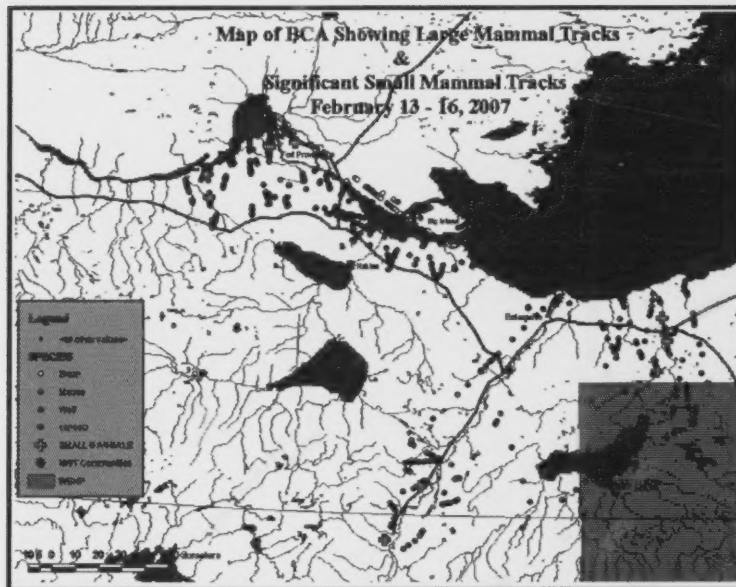


Figure 7.4 Map showing large mammal and significant smaller mammal track sightings made during the February semi-comprehensive survey, February 13 - 16, 2007.

### Wildlife Observations

During the 2006 –2007 surveillance season we received no reports of bison nor did we observe bison in the BCA. During surveillance flights we did not observe any attempts by bison (*i.e.* fresh tracks) to cross the Mackenzie River. All bison observed during shoreline patrols or surveillance flights were located on the north side of the Mackenzie River in the Mackenzie Bison Sanctuary (MBS). The cumulative totals of large mammals observed during shoreline patrols and surveillance flights were 3746 bison, 26 boreal woodland caribou, 71 moose, and 3 wolves (Table 3).

Bison were most often observed along the north shore of Mills Lake and on the north shore of the Mackenzie River, in scattered small groups between Slave Point and the mouth of the Horn River (Figures 6.1- 6.12, 7.1 and 8.1). There were two small groups of bison that stayed in the vicinity of the Mackenzie ice crossing and on one

occasion a bison was reported heading towards the south shore. The Fort Providence Renewable Resource Officer, who reported that it returned to the north shore of the Mackenzie River shortly thereafter, monitored this animal.

During shoreline patrols moose were observed along the north and south shores of the Mackenzie River around Mills Lake, and near Big Island. On surveillance surveys moose were observed along the south shore of the Mackenzie River, south of Mills Lake, around Buffalo Lake and by the NWT/ Alberta border (Figures 6.1-6.12, 7.1, and 8.1). No caribou were observed during shoreline patrols. During surveillance surveys most caribou were seen north of Buffalo Lake and the base of the Cameron Hills.

Wolves were observed during shoreline patrols this season in the vicinity of Mills Lake and on the north shore of the Mackenzie River north of Fort Providence (Figures 6.2, 6.4 and 6.5). No wolves were seen during the semi-comprehensive or comprehensive surveys but a wolf kill was observed south of Mills Lake during the February semi-comprehensive survey (Figure 7.3).

Based on the concentrations of large mammal tracks, most of the activity during February appeared to be south of Mills Lake, between Buffalo Lake and Cameron Hills. There was a greater concentration of large mammal tracks east of Hay River between Buffalo Lake and Great Slave Lake. In March, concentrations of large animals appeared to be widely scattered with the weakest concentration of animals east of the Cameron Hills near the Mackenzie highway, south and west of Buffalo Lake to the Mackenzie highway (Figures 7.2 and 8.2).

Certain concentrations of smaller mammal (like wolverine, lynx, fox, otter etc.) activity, where it appeared with large mammals, were recorded as well. There appeared to

be no significant relationships between these two groups and it was not the point of this survey to gather information relating to smaller mammals.

Table 3 Recorded sightings of large mammals observed during all surveillance flights in the Bison Control Area from December 2005 to April 2006.

Species	Shoreline Patrols (n=12)	Surveillance Flights		Totals
		Semi-Comprehensive (n=1)	Comprehensive (n=1)	
Bison *	3496	30	220	3746
Boreal Woodland Caribou	0	14	12	26
Moose	43	10	18	71
Wolf	3	0	0	3

\* Note: All bison reported were found outside the Bison Control Area during shoreline patrols or surveys on the north shore of the Mackenzie River.

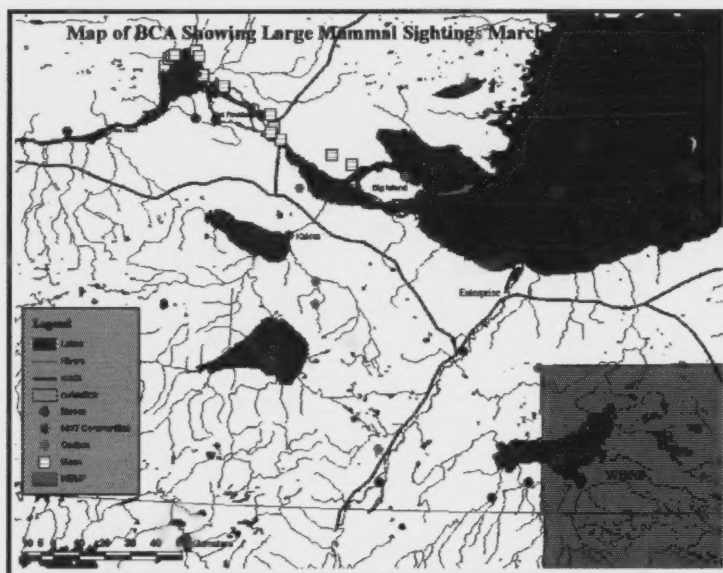


Figure 8.1 Large mammals observed during the March 19 – 24, 2007 comprehensive survey of the Bison Control Area, Zones I & II.

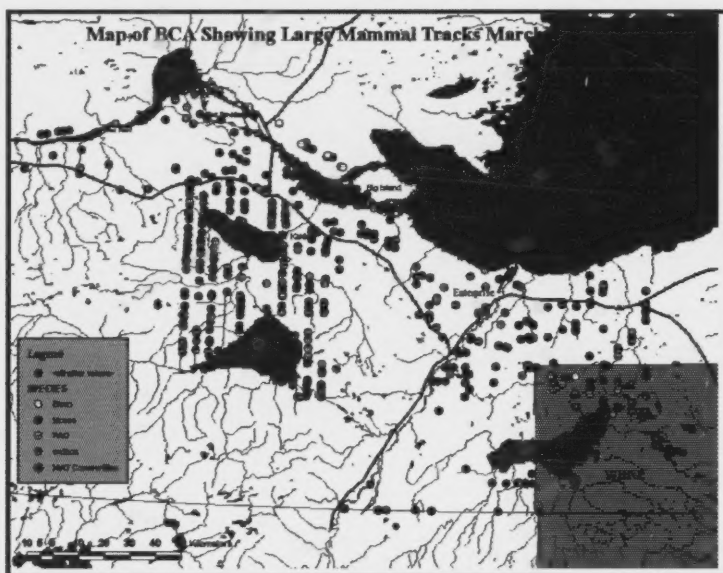


Figure 8.2 Map showing large mammal tracks stratified by major species, recorded during the March comprehensive survey of BCA Zones I and II, March 19 – 24, 2007.

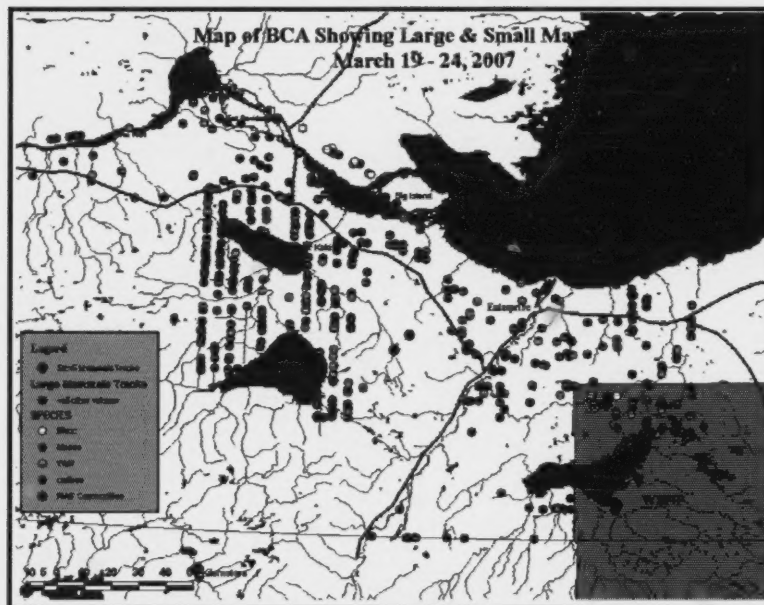


Figure 8.3 Large mammals & associated smaller mammals tracks sighted during the March comprehensive survey of the BCA, Zones I and II, March 19 – 24, 2007.

### Communications

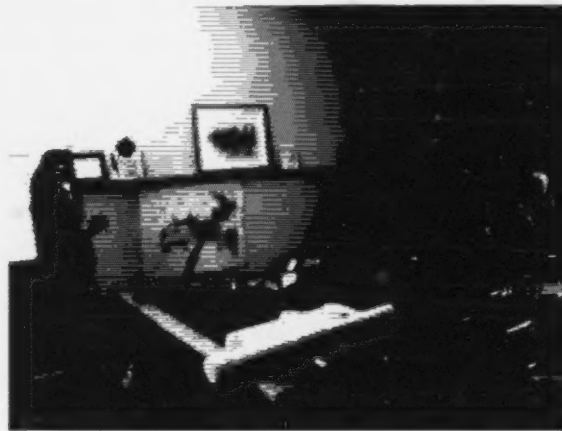
The plan for public consultation in 2006/2007 included a combination of public meetings, posters, radio broadcasts on several local radio stations, magazine displays and the completion of the BCA website. All communities and interest groups were contacted with a letter and several posters at the beginning of the season to explain the program and the role of the BCA technician.

Literature from previous years' programs was reviewed at the beginning of the project and communities that had not been visited recently or at all were identified. Emphasis on holding public meetings was placed on those communities identified during the literature search and arrangements were made well in advance with group contacts to meet. Also, several communities where turnout had been poor the previous year were



added to the list. The BCA technician began contacting all band and community offices during December.

The BCA technician met with the West Point First Nation (December 13/06), K'athlodeeche First Nation (January 17/07), Fort Providence Resource Management Board (January 17/07), Hay River Metis Council (January 18/07), and Ka'a'gee Tu First Nation, Kakisa (February 28/07), to hold public information meetings and the response from the groups, with the exception of K'athlodeeche, was very good. The bison program was explained using a PowerPoint presentation (Appendix E). Discussion was promoted and comments from the groups were collected. Attendance at public meetings ranged from eight in Kakisa to over 12 at Fort Providence. The higher turnout in Fort Providence was likely due to the encouraging efforts of the Resource Management Council Manager and by involvement of the local people in the community in monitoring, in cooperation with ENR.



Slide 3

A photograph of the meeting with the Hay River Metis Government Council January 18, 2007.

The school was also briefly visited in Kakisa and students attended the meeting where a number of questions were asked. Diamond Jenness High School was also visited and over a period of two days four classes, grades 10 to 12, were given a presentation followed by a discussion (Appendix E (2)).

The BCA technician met with members of the WBNP staff in early January to outline the planned work schedule and to solicit any advice concerning methodology and bison activity in the areas adjacent to the BCA. Suggestions were made for changes to the BCA website.

The poster "If You See A Bison" was distributed to the West Point First Nation, Hay River, K'atloodeche First Nation, Hay River, Ka'a'gee Tu First Nation, Kakisa, Sambea' K'e Dene Band, Trout Lake, Enterprise Settlement Council, Deh Gah Got'ie Dene Council, Fort Providence, Fort Providence Metis Local No. 57, Fort Providence Management Board, Tthedzeh K'edeli First Nation, Jean Marie River, Hay River Metis Government Council, Deninoo Community Council Fort Resolution, Fort Resolution Deninu K'ue First Nation, Fort Simpson Liidlil Kue First Nation, and Fort Simpson Metis Local Number 52. "If You See A Bison" pamphlet, and "Protecting Healthy Bison" and "The BCA Zones" posters, were distributed to all of the above groups.

A half page colour advertisement was included in the 2007 Explorers Guide, page 125 (Appendix D). This advertisement was designed with the intent of reaching a wider audience; its aim was to inform the public about the Bison Control Program, its goals and to solicit public participation. It also was designed to reflect the present changes to the Department of Environment and Natural Resources to facilitate easy access for public information.



A 30 second radio broadcast has been developed for broadcast during the off-season when the project is not in operation. Plans are to run announcements on several different radio stations over the next four to eight weeks. This will be broadcasted on CKLB, CJCD & CBC (Appendix C).

## DISCUSSION

In the 2006 – 2007 surveillance season, we did not observe bison or bison sign (*i.e.*, tracks and/or feeding craters) in the BCA during weekly shoreline patrols, the semi-comprehensive and comprehensive surveillance surveys. However, as mentioned in this report, bison were seen at one point well onto the Mackenzie River ice crossing, therefore, the occurrence of bison crossing the river is important. Thus, absence of bison in the BCA should not be presumed, especially as there is a long period in the off-season when the program is not active and there is no snow to make tracks visible. It is important that these surveys remain ongoing to ensure that the BCA is maintained as bison free.

This year the BCA technician was able to start in late November and as a result was able to provide direction for the collection of data. Prior to the semi-comprehensive and comprehensive surveys, the BCA technician relayed and distributed important information and instructions to all survey participants so each person was prepared and equipped by survey commencement. We have strong confidence in the quality of data collected by the observers for all surveys.

We continued to extend survey coverage during the semi-comprehensive and comprehensive surveys further into the northwest corner of WBNP in the area north of Buffalo Lake and west of approximately longitude 114° 30' W. We also extended coverage into Alberta a short distance during the semi-comprehensive survey to investigate potential pasture and possible bison movement from the Hay Zama Herd or the WBNP herds. Although no bison were observed in this area, the addition of such coverage continues to improve our knowledge of areas along the northwestern park border where bison would most likely disperse (Gates & Wierzchowski 2003). There

should be no need to extend the survey into Alberta in future, but coverage of the northwest corner of the Park should continue.

We suggest that survey effort for surveillance surveys in subsequent years continue to reflect the existing updated flight routes, as there are bison in the northwest park area and there is good bison habitat in the vicinity of the Hay River near the NWT/Alberta border. This makes bison dispersal from the park and the Hay-Zama herd a distinct possibility.

This season we continued sampling quality and precision by utilizing a known strip (transect) width (500 metres) during surveillance surveys. Implementing a strip (transect) width enabled us to more or less accurately calculate percent coverage prior to surveys. Considering the difficulty of maintaining the exact height above ground while flying, we ensured that we maintained the greatest possible coverage, given the available flying hours. This technique should continue, as it will enhance forthcoming surveillance surveys with heightened precision and increased methodical strength.

Public consultation and communication were expanded further this season, in an attempt to inform the public, thereby encouraging the report of any possible bison sightings.

Recommendations (subject to departmental budgetary restraints and priorities):

- We should continue to hold meetings with community members in Zone III of the BCA, because there is currently no surveillance in this area. As we rely solely on reported public sightings to monitor this region, it is essential that we meet with community residents in order to obtain feedback.
- More intensive visits were made to two schools and this should be continued further as the message will go home to the parents and therefore

out into the community. Questions and comments from students were highly intelligent and innovative, and moderate effort in this regard should continue.

- Letters were written to all interest groups followed by telephone calls to those targeted for meetings explaining the program and requesting an opportunity to meet. This worked well to contact the affected groups and should continue.
- Publishing information about the Bison Control Program in major newspapers of the Northwest Territories during summer months should be considered. This will maximize exposure to both residents and tourists.
- All relevant BCA information pamphlets currently on display and in circulation should be inventoried and, if necessary, updated. Applicable Band offices and tourist centres in the NWT should be contacted to inquire whether supplies need replenishing.

Development of a database that stores location coordinates of probable areas of interest to bison (i.e. meadows, high density corridors, etc...) near standard surveillance routes should be considered next season. These locations may be selected in a number of ways by:

- Conducting habitat analysis using satellite imagery based on vegetation types and proximity to diseased herds;
- Locating areas based on results from studies such as Gates and Wierzchowski's landscape evaluation of bison movements and distribution (2003); and
- Using compiled survey data to extrapolate potential areas of interest.

Creation of a prospective bison habitat database would be beneficial to the BCA program in terms of aiding in future survey planning and increasing our knowledge of potential bison habitat around BCA.

### ACKNOWLEDGEMENTS

ENR South Slave Region, Fort Smith, NT and WBNP, Parks Canada Agency, Fort Smith, NT funded the BCA program for the 2006 - 2007 surveillance year.

A number of people played an important role in conducting the Bison Control Area program during the 2006 - 2007 surveillance season. Shared Services personnel Gladys Schaeffer and Melissa Johns in Fort Smith handled administrative aspects such as travel, staffing and pay records. Assistance from Renewable Resource Officer Evelyn Krutko of Fort Providence was invaluable in arranging for observers, assisting with logistics and sharing their concerns as well as providing advice for the on-going success of the Bison Control Program. Assistance provided by Darren Campbell of the Fort Providence Resource Management Board in arranging, advertising and locating community meetings is greatly appreciated.

We thank the community participants, as well as the West Point First Nation, Deh Goh Got'ie Dene Council and the Hay River Metis Government Council, who assisted in the surveillance flights; they are Lester Antoine, Lucas Elleze, Calvin Canadian, of Fort Providence; and from Hay River, Henry Collins and Robert Buckley. Thanks also go to aircraft pilots; Ivan Bourque and Brent MacDonald of Northwestern Air Lease Ltd, and Darcy and Taylor King from Landa Aviation Ltd. for their input and expertise during surveillance and shoreline patrol flights.

The assistance of Kim King and Gerrard Carroll in arranging for BCA presentations at Diamond Jenness Secondary School and Sheila Hilyard, for help with the presentation in Kakisa is thankfully acknowledged. Gratitude also goes out to ENR's Wildlife Management Support Services, Data Coordinator, Doug Hartt, who assisted with the development and activation of the BCA website. The assistance of Nahum Lee, South



Slave Wildlife Technician during the semi-comprehensive survey and William Mandeville for correlating data and the development of the GIS maps, is very much appreciated.

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## APPENDIX A

Summary of weather conditions during shoreline patrols and surveillance flights throughout the Bison Control Area Program surveillance season 2006-2007

Summary of weather data during shoreline patrols – BCA 2006/2007 surveillance season.

Date	Patrol #	Zone	Temp	Winds	Sky	Light	Intensity	Snow Cover
20-Dec-06	1	1	-4	SW-5	Broken	Flat	Medium	Complete
31-Dec-06	2	1	-4	W-2	Broken	Bright	High	Complete
05-Jan-07	3	1	-17	L & V	Scattered	Bright	Medium	Complete
11-Jan-07	4	1	-29	NNW-8	Broken	Bright	High	Complete
18-Jan-07	5	1	-20	Calm	Clear	Bright	High	Complete
24-Jan-07	6	1	-11	NE-10	Overcast	Flat	Medium/Low	Complete
03-Feb-07	7	1	-18	0	Clear	Bright	High	Complete
08-Mar-07	8	1	-11	NE-8	Broken	Flat	Medium	Complete
15-Mar-07	9	1	-20	NW-9	Haze	Bright	Medium	Complete
28-Mar-07	10	1	-5	E-8	Clear	Bright	High	Complete
05-Apr-07	11	1	-1	E-6	Clear	Bright	High	Complete
12-Apr-07	12	1	2	S-3	OVC	Flat	Medium	Complete

Summary of weather data during surveillance surveys – BCA 2006/07 surveillance season.

Date	Survey	Zone	Temp	Winds	Sky	Light	Intensity	Snow Cover
13-Feb-07	Semi	1&2	-6	SW-5	Clear	Bright	High	Complete
14-Feb-07	Semi	1&2	-9	W-15	Clear	Bright	High	Complete
14-Feb-07	Semi	1&2	-6	SW-10	Clear	Bright	High	Complete
15-Feb-07	Semi	1&2	-18	NW-10	Broken	Bright	Medium	Complete
16-Feb-07	Semi	1&2	-25	NW-5	Part OBS	Bright	Medium	Complete
19-Mar-07	Comp	1&2	-20	Calm	Clear	Bright	High	Complete
20-Mar-07	Comp	1&2	-18	NE-5	Overcast	Bright	Medium	Complete
21-Mar-07	Comp	1&2	-20	NNE-3	Clear	Bright	High	Complete
21-Mar-07	Comp	1&2	-8	Calm	Thin OVC	Bright	High	Complete
22-Mar-07	Comp	1&2	-3	SW-3	Clear	Bright	High	Complete
22-Mar-07	Comp	1&2	5	SW-10	Clear	Bright	High	Complete
23-Mar-07	Comp	1&2	2	Calm	Broken	Bright	Medium	Complete
23-Mar-07	Comp	1&2	8	S-5	Overcast	Bright	Medium	Complete
24-Mar-07	Comp	1&2	4	Calm	Clear	Bright	High	Complete

## APPENDIX B

Summary of surveillance activities and removals of bison from the Northwest Territories  
Bison Control Area Program (1988/89-2004/05).

Aerial surveillance						
Year	Shoreline Patrols	Semi- Comprehensive Surveys	Comprehensive Surveys	Total Hours	Snow-mobile Ground Patrols	Bison Removals
1988 / 89	1					
1989 / 90	2					
1990 / 91	2					
1991 / 92		7				
1992 / 93			3			9 <sup>a</sup>
1993 / 94	14 <sup>b</sup>		1		23	
1994 / 95	10 (26) <sup>c</sup>	6 (94)	1 (34)	153	33	2 <sup>d</sup>
1995 / 96	11 (35)	3 (48)	1 (41)	123		3 <sup>e</sup>
1996 / 97	21 (62)	3 (45)	1 (46)	153		
1997 / 98	14 (43)	3 (46)	1 (48)	137		
1998 / 99	14 (43)	2 (30)	1 (45)	117		
1999 / 00	14 (42)	2 (28)	1 (46)	115		
2000 / 01	13 (40)	2 (30)	1 (50)	120		
2001 / 02	14 (42)	2 (29)	1 (42)	113		
2002 / 03	11 (25)	2 (22)	1 (40)	87		
2003 / 04	13 (31)	1 (11)	1 (37)	78		
2004 / 05	12 (29)	1 (14)	1 (33)	76		
2005 / 06	11 (23)	1 (14)	1 (36)	88		
2006 / 07	12 (?)	1 (18.5)	1 (35.9)			

<sup>a</sup> 17 May 1992: 7 bulls shot near Point de Roche

31 May 1992: 1 bull shot near Point de Roche (no lymph nodes collected)

Serological testing for Brucella was negative for all 9 bulls, no lesions consistent with tuberculosis observed on gross pathology or histopathology.

<sup>b</sup> Four patrols covered the Hay River area and extended inland to the northwest park boundary.

<sup>c</sup> Numbers in brackets represent survey hours( rounded off to the nearest hour).

<sup>d</sup> 8 March 1995, 1 cow shot by hunter along south shore of Mackenzie River. Cow had likely been wounded by wolves. Blood serum and retropharyngeal lymph nodes collected.

13 October 1994, prior to the surveillance season beginning, 1 bison shot by hunter near the eastern boundary of the BCA. Blood and tissue samples collected but no evidence of brucellosis or tuberculosis.

<sup>e</sup> 19 March 1996: 3 cows killed by hunter on the south shore of Mackenzie River. Blood serum (n=2) and retropharyngeal lymph nodes (n=3) collected. No serological reactors to brucella, and lymphatic tissue normal on gross examination.



### APPENDIX C

A 30 second public service announcement to be aired on; CBC Radio North when and as space is available weekly, and CJCD April 12 & 13, plus every Thursday and Friday until July 13. CJCD will air a similar 30 second script every Friday starting April 6<sup>th</sup> and ending July 28.

**Script:**

Public Service Announcement for Radio

## Bison in the Buffer Zone

Bison populations in Wood Buffalo National Park and the adjacent Slave River Lowlands are infected with tuberculosis and brucellosis.

A buffer zone has been created to prevent contact between these diseased bison and the healthy bison to the north.

The buffer zone lies south of the Mackenzie River to the Alberta border and between Trout River in the west and Buffalo River in the east.

All bison in this area are presumed to be disease carriers and must be removed for testing.

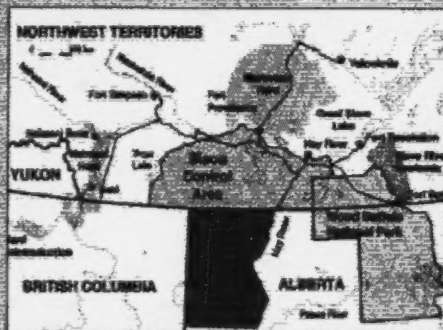
If you see bison in the buffer zone, please contact the nearest Environment and Natural Resource Office.

## APPENDIX D

The half page colour article published in the 2007 Explorer's Guide magazine.

## IF YOU SEE A BISON IN THE CONTROL AREA...

Bison populations in the Slave River Lowlands and the Wood Buffalo National Park area are infected with bovine tuberculosis and brucellosis. In 1987, the Bison Control Area (BCA) was created to prevent the spread of these diseases to the healthy Mackenzie and Nahanni herds. The BCA program is jointly funded by the Parks Canada Agency and the Government of the Northwest Territories.



All bison in the BCA are presumed to be diseased and must be removed and tested.

In the Northwest Territories, two herds have been re-established and are disease-free. The Mackenzie herd numbers approximately 2000 animals, and represent the largest herd of healthy wood bison in Canada and a cornerstone in the northern wood bison recovery program. The Nahanni herd now numbers about 300 animals.

Please report any bison sightings in the BCA as soon as possible to the nearest Environment and Natural Resources (ENR) office.

Under Northwest Territories Wildlife regulations, a resident may at anytime, hunt bison within the BCA. A hunter who kills a bison in the BCA is required to report the incident as soon as possible.

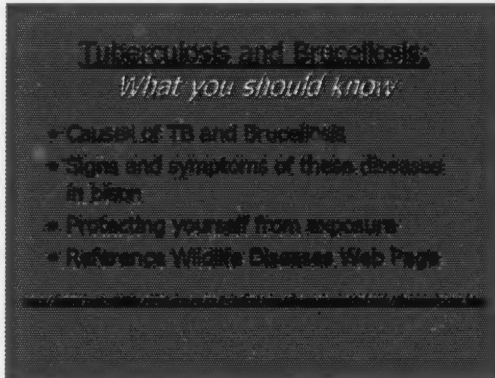
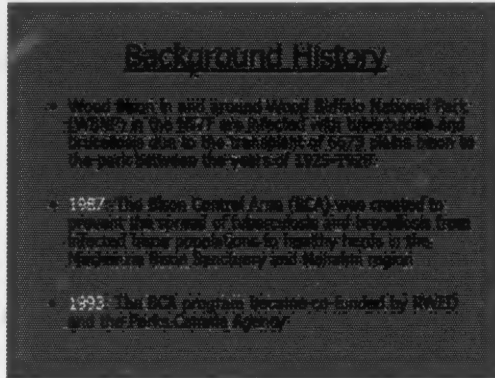
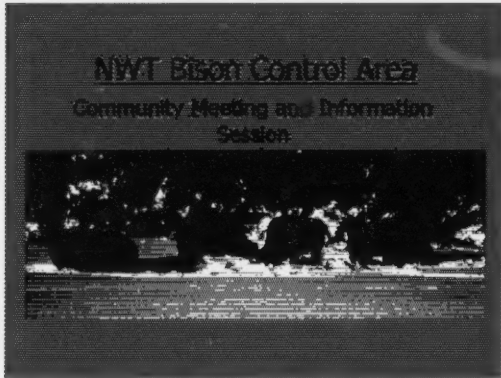
If you would like more information regarding the Bison Control Program, please contact any ENR office.

PHONE: Hay River (867) 675-6558 • Fort Resolution (867) 629-3002  
Fort Liard (867) 776-4311 • Fort Smith (867) 872-6400 • Fort Simpson (867) 625-7478



## APPENDIX E

E (1): Slideshow presentation utilized during BCA community meetings (read left to right)



## Tuberculosis

### What causes TB?

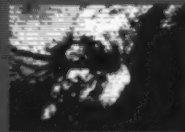
- TB is caused by *Mycobacterium tuberculosis*

### What are the signs and symptoms?

- Cough, sputum, blood in sputum, weight loss, or decreased appetite
- Night sweats, fever, or chills
- Fatigue, loss of appetite, or weight loss
- In some cases, TB can spread to other parts of the body, such as the lungs, kidneys, or spine

### How is TB treated?

- TB is treated with antibiotics
- TB can be cured if treated properly
- TB can be prevented by taking TB medicine
- TB can be prevented by not smoking



## Brucellosis

### What causes Brucellosis?

- Brucellosis is caused by a bacteria (*Brucella* spp.)

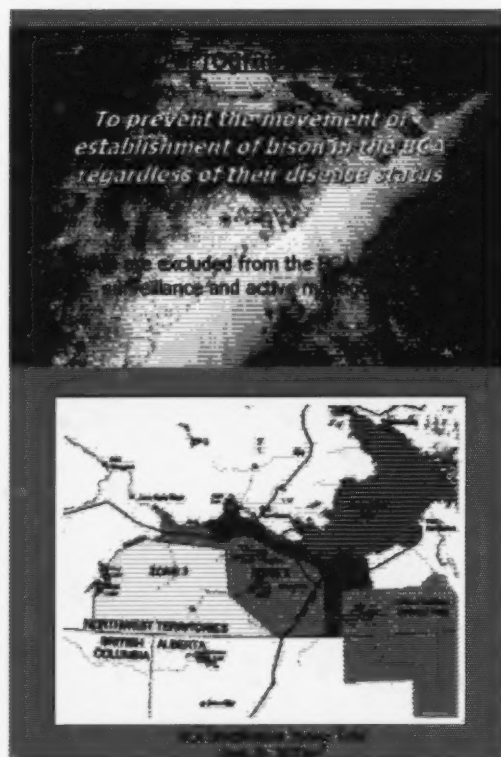
### What are the signs and symptoms?

- Fever, chills, sweats, and fatigue
- Joint pain, muscle aches, and weakness
- Headache, loss of appetite, and weight loss
- In some cases, Brucellosis can spread to other parts of the body, such as the bones, skin, and nervous system

### How is Brucellosis treated?

- Brucellosis is treated with antibiotics
- Brucellosis can be prevented by not drinking raw milk
- Brucellosis can be prevented by not eating undercooked meat
- Brucellosis can be prevented by not swimming in untreated water





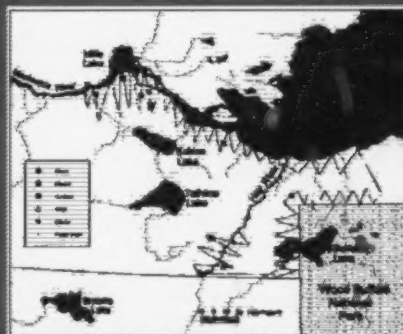
### Zone 1

- Range: Extends from Asp Point on the south shore of the Mackenzie in the west to Little Buffalo River in the east
- Degree of monitoring: Weekly Shoreline flights, Semi-Comprehensive & Comprehensive Survey
- High Risk: Becht groups consistently use habitat along the north shore of the Mackenzie River

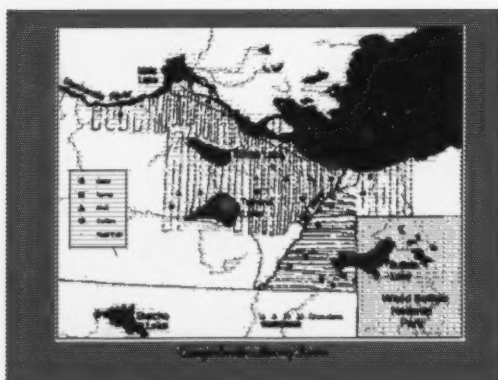


### Zone 2

- Range: Covers more southern areas down to the border that include Kakisa and Tahliana Lake.
- Degree of Monitoring: Semi-Comprehensive Survey once per season and Comprehensive Survey once per season
- Moderate Risk







### Zone 3

- Range: Expands from Teput Lake to near the western edge of Taltitina and down to where the west slope of Hay River intersects the border
- Degree of Monitoring: Monitored through the general public and area residents. The program includes a comprehensive public awareness component that solicits reports of any bison sighted
- Low Risk: No aerial surveillance

### Verification Patrols

- Follow up reported sightings in the BEA
- How we get to sighting locations: access and situation dependent



### Harvesting Bison in the BCA

- Resident hunters may shoot bison in the control area at any time, but are required to report kills to nearest ENWD office as soon as possible



## Public Awareness Program

- Various media are used to inform and educate the public about the BCA program:  
Radio, TV, Internet and other promotional material

- Community meetings and information sessions also provide important feedback.



## Facts

- Tuberculosis and Brucellosis are of public health concern.
- Wood Bison are considered a threatened subspecies of North American Bison by the Government of the State of Endangered Wildlife in Canada (COSEWIC).
- The Woodlands have had nearly 1000 cases from 1980 and due to the high density of bison, it is very likely that disease could occur.
- In 1982-May 1991: 8 bison shot near Point de Roche.
- In 1987-March 7th: 1 bison shot and shot by Provincial Wildlife.
- In 1988-March 25th: 3 bison killed by a Fort Providence Hunter.

\*All bison are tested for TB and Brucellosis.

### Questions???



Thanks for coming out and  
remember to report any bison  
sightings to your nearest RWED  
office

E (2): Slideshow presentation utilized during BCA community meetings and designed for school presentations (read left to right)



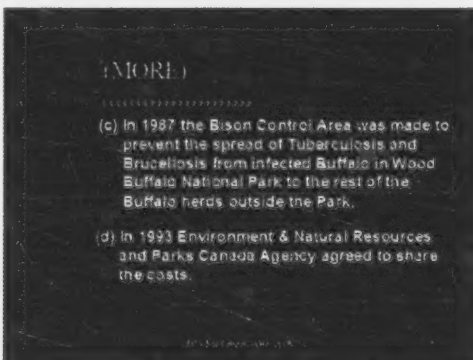
### The Problem:

Some Wood Buffalo in and near Wood Buffalo National Park are sick....



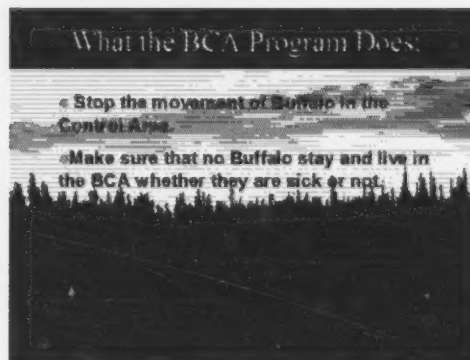
### WHAT HAPPENED BEFORE:

- (a) When Wood Buffalo National Park was new, from 1925 to 1928, about 5673 plains buffalo were moved up to the Park and released near Fort Smith.
- (b) This caused concern that the disease would spread to all healthy Wood Bison.



### (MORE)

- (c) In 1987 the Bison Control Area was made to prevent the spread of Tuberculosis and Brucellosis from infected Buffalo in Wood Buffalo National Park to the rest of the Buffalo herds outside the Park.
- (d) In 1993 Environment & Natural Resources and Parks Canada Agency agreed to share the costs.



### What the BCA Program Does:

« Stop the movement of Buffalo in the Control Area

« Make sure that no Buffalo stay and live in the BCA whether they are sick or not.



## What Are Tuberculosis & Brucellosis?

### Tuberculosis

- Caused by a bacteria
- In animals you can see them having a hard time breathing
- You may see them coughing
- You may see a runny nose or mucus from the mouth
- In Lungs, small rounded lumps (tubercles)

### Brucellosis

- Also caused by a bacteria.
- Swollen leg joints the animal will limp.
- Female will have a swollen belly.
- Sores under the skin, in the meat and in the heart, lungs and other organs.

### Butcher

Butcher the animal carefully and do not cut into infected parts.

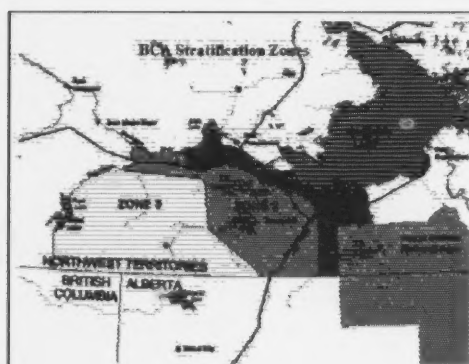
Wash your hands, knives and clothes with hot soapy water after handling the animal.

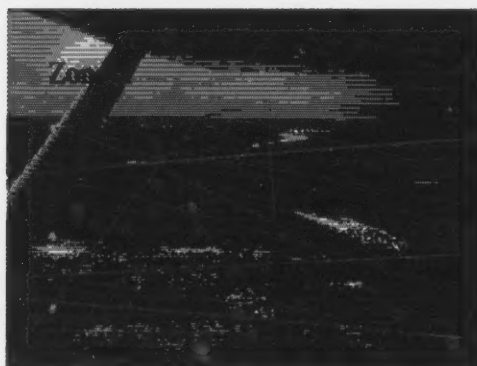
Do not spill fluid from infected parts onto the meat.

FOR MORE INFO...

• We divide the British Columbia Area into different zones to allow us to concentrate on the zone that has the most cases of the animal's disease and address it.

• We have three zones in the Fraser-Cootner Area.





### Zone III:

- This is an area where we least expect Buffalo to meet other sick Buffalo.  
It extends from Trout Lake to near the western edge of Tatlaya Lake and down to where the west shore of the Hay River meets the Alberta/NWT border.
- No surveillance is completed in this zone.
- We rely on the public to report Buffalo.

### How We do This:

- Surveillance of the BCA with intensive aerial Patrols from December to April each year.

And

- This is done three ways:

### Shoreline Patrols:

- Not actually a survey.
- Weekly aerial shoreline rounds from Fort Resolution.  
Follows the shoreline between Mills Lake & Slave Point.  
(Map)



An Example of a Patrol Throughout Year In Area of Interest



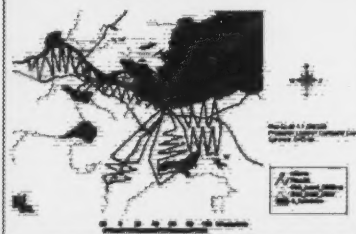


### Semi-Comp Survey:

- Occurs in mid February.
- Takes 3 - 4 days to do.
- Called Semi Comprehensive because it covers less Zones that later surveys and is not as detailed.
- A survey is conducted over the area where Buffalo are most likely to be seen. (Zone I)
- A predetermined set of checkpoints (waypoints) are used to ensure complete coverage of the area.
- Signs of possible Bison are investigated between checkpoints.

U.S. Fish & Wildlife Service, Bureau of Land Management

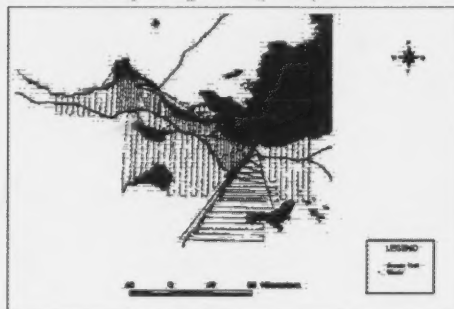
### February Band-Comprehensive Survey Flight Lines



### Comprehensive Survey:

- Completed once a year.
- More detailed, covers Zones I & II.
- Takes 7 - 8 days to do.
- The determined Waypoints are used to ensure total coverage and consistency.
- Habitat & Terrain features are considered for investigation.
- Completed late March while snow cover is still present.

### March Comp Survey Showing Survey Route Grid



### Verification Patrols:

- Done as a follow up on reported Buffalo sightings.
- How we get there is dependent on the situation.
- Aircraft.
- Truck.
- Snowmobile.

U.S. Fish & Wildlife Service, Bureau of Land Management

Information on the web site is updated regularly.



How we get there is dependent on the situation.

U.S. Fish & Wildlife Service, Bureau of Land Management

